We very much appreciate the overall positive attitude of the referee to our manuscript and thank him for particularly useful comments. The comments, questions and suggestions of the referee are presented in italics.

1. "*The authors briefly discuss applicability of the weakly nonlinear model. But it is not very convincing. If nonlinear corrections to phase velocity reach 50%, it may change the result significantly.*
Thank you; we just forgot to describe the estimate of the upper limit of wave amplitudes for which the Gardner equation is suitable in the South China Sea conditions. Thus, we added: "In the light of estimates of Maderich et al (2009, 2010), the presented relationships signal that the Gardner equation is suitable for the description and analysis of properties, propagation and dynamics of internal waves with the amplitude of up to 20 m in the South China Sea conditions."

I do not understand the 20% estimate for both amplitudes and velocities of solitons: usually of them is taken empirically and the second is calculated based on that.
Sure, we deleted "velocities"

Also how nonlinear corrections to the mode structure affect the GE parameters?"
First of all, it concerns the coefficient at the cubic nonlinear term (Eq. 7). Without such a correction (e.g. within the two-layer model) this coefficient transforms into the expression obtained by Kakutani & Yamasaki, (1978)

$\alpha_1 = -\frac{3c}{8h_1^2 h_2^2}(h_1^2 + h_2^2 + 6h_1 h_2)$, which is negative everywhere.

For more complicate stratifications it may be positive, negative or vanish. Such variations are studied based on several examples of three-layer stratification in (Grimshaw et al, 1997; Kurkina et al., 2015). We feel that it is not really necessary to repeat their arguments and thus decided to add the following remark (P.5, L.20)
"The impact of stratification and mode correction on the value and sign of the coefficient at the cubic term in Gardner equation is analysed in detail in (Grimshaw et al, 1997; Kurkina et al., 2015)."
We also corrected a typo in Eq. (7).

2. *"Even more important is that after all the calculations no single comparison with the observed internal waves is given. What kind of nonlinear waves was observed at the second mode? Is there anything more specific in the literature than just box 2 in Fig. 1? If so it would add a justification for the detailed mapping, and vice versa."*
We agree that observations of internal solitary waves of the second mode are scarce in the South China Sea; however, this is the general feature of many seas and oceans. However, we do not fully agree with the critics of Referee as we have discussed examples of solitary waves of concave and convex type that have been observed in the Western South China Sea (Yang et al., 2009, 2010).
As there are, to our knowledge, no more descriptions of observations of this type in the international scientific literature, we are not able to expand this part of the manuscript.
The only one comparison what we can do is to visualize Gardner's solitons with different amplitudes and coefficients that are calculated maximally close to the point of the above-mentioned observation. After that we may try to compare the shape of the Gardner soliton of the corresponding amplitude with the shape of the observed solitary waves. Such a comparison makes sense if there are simultaneous recordings of temperature and salinity (or density) profiles in the measurement area. The aim of our work was to establish certain average seasonal characteristics of the internal waves of

the second mode and a general analysis of their possible combinations that determine the type, shape, and velocity of localized waves.

3. "*For the deep parts of the SCS: what should be the wavelength of the IW to fit the long-wave approximation? Are the observed waves long enough for that?* "

An internal wave can actually be considered as a long wave when the relation $\beta k^2 << c$, which implicitly depends on the sea water density stratification and includes dispersive coefficient β and long linear internal wave phase speed c, is satisfied. Here $k = 2\pi/\lambda$ is the characteristic wavenumber and λ is the characteristic length scale. (In the opposite case the waves are of intermediate length or short waves).

This condition can be much more gentle than just $H << \lambda$. For example, solitary waves of the second mode were observed in the shelf region of the South China Sea with the depth of about 300 m (Yang et al., 2009, 2010). The dispersion coefficient there is about 1500 m^3/s and the speed of propagation is about 0.5 m/s (Fig.12a). Therefore, waves longer than 350 m can be already considered as long waves in this region. The length of internal solitary wave of the second mode detected in (Yang et al, 2009) is about 350 m and this wave, consequently, can be treated as a long wave.

In deeper parts of the South China Sea internal waves can propagate either as a practically linear (sinusoidal) disturbances or as a steepening baroclinic tide, predominantly of the first mode. There may also exist reflected localized disturbances of the second mode generated on the unevenness of the bottom from the waves of the first mode. When such waves propagate in an inhomogeneous medium, they will undergo slow adiabatic changes or faster transformations. When they propagate into the region of increasing depth, their amplitudes will decrease and their lengths will increase, so they still can be considered as long waves.

As this material is, in essence, classic, we do not feel necessary to reflect it in the manuscript.

4. "*Sorry if I missed that but what stratifications were used for calculation and mapping? It is mentioned about two pycnoclines but only a simple model is shown in Figure 3 (so only the total depth was varied according to the bathymetry?)*"

We used averaged stratifications from GDEM climatology, from which we numerically evaluate the local stratification. We make this clear in the revised version already in the abstract. Fig. 3 is just schematic one to show the types of polarity of second-mode internal waves.

5. "*If alpha is mostly negative, and alpha1 is also negative, what kind of solitons can exist in this area? There is no flat-top solitons in this case. 6. The paper text is short but it is overloaded by figures. In my opinion, figures like 6-10 which show intermediate values are not necessary.*"

Based on the weakly nonlinear theory (Gardner's equation), if α_1 is negative, the solitary wave may change their amplitude from 0 to the limiting value $A_{\text{lim}} = \alpha/\alpha_1$. The polarity of such solitary wave depends on the sign of the quadratic nonlinear term expressed by α. A solitary wave with an amplitude close to the limiting amplitude is has a shape of the "thick" or "table-top" solitary wave. If $\alpha < 0$, a table-top solitary wave of depression may exist (Pelinovsky et al., 2007).

As for figures, we are in a complicated position because Referee #1 wishes to see some additional images. We feel that Figures 6–10 are still important as they present some flavor of the physical structure of water masses in the study area and carry important information about the frequency of occurrence of the relevant normalized background conditions.

Minor notes: *"solitary wave that interact elastically" -so it is a priori weak, integrable nonlinearity in a 100 m wave?*

This remark is deleted.

How do you know? "highly energetic [?] internal waves of higher modes" -What do you mean by that?

We deleted the words “highly energetic”.

“*The coefficients at the quadratic and cubic terms of Gardner equation for internal waves of the second mode are practically independent of water depth.”- How can? Probably you mean the case of a deep lower layer? “are qualitative similar” -better “qualitatively” (this is about the only typo I noticed).*
The text is changed as follows: “The coefficients at the quadratic and cubic terms of Gardner’s equation for internal waves of the second mode mainly depend on the stratification and much less on the total water depth.” Also, the typo has been corrected.

Why “Vaisala” rather than “Brunt-Vaisala?”
Replaced to “Brunt-Väisäla”.